FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

R10: Direct and inverse proportion

Reason about direct and inverse proportion

20 marks · 25 minutes · Non-calculator

1) y is directly proportional to x, and $y = 12$ when $x = 3$. Show that $y = 20$ when $x = 5$

[Question 1: 2 marks]

2) Explain why, for a fixed distance, speed and time are inversely proportional.

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[Question 2: 2 marks]

3) 6 workers take 10 days to do a job. Ana says 12 workers would take 20 days. Explain her mistake.

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[Question 3: 2 marks]

4) y is inversely proportional to x, and $y = 6$ when $x = 4$. Show that $y = 3$ when $x = 8$

[Question 4: 2 marks]

5) Explain how you can tell from a table of values whether two quantities are in direct proportion.

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[Question 5: 2 marks]

6) Show that y is inversely proportional to x.

x	2	4	8
y	12	6	3

[Question 6: 2 marks]

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7) y is directly proportional to x^2, and $y = 18$ when $x = 3$. Show that $y = 50$ when $x = 5$

[Question 7: 2 marks]

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8) The cost of fuel is proportional to the volume. 40 litres cost £58. Show that 25 litres cost £36.25.

[Question 8: 2 marks]

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9) y is directly proportional to x^2. Explain what happens to y when x is tripled.

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[Question 9: 2 marks]

10) d is directly proportional to t^2, and $d = 45$ when $t = 3$. Show that $t = 4$ when $d = 80$ ($t > 0$).

[Question 10: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Shown	$y = 4x$ (M1); C1.
2	Explanation	Speed $\times$ time = distance, which is constant (C2).
3	5 days	More workers means less time (C1); B1.
4	Shown	$xy = 24$ (M1); C1.
5	Explanation	The ratio $\frac{y}{x}$ is the same for every pair (C2).
6	Shown	$xy = 24$ each time (M1); C1.
7	Shown	$y = 2x^2$ (M1); C1.
8	Shown	£1.45 per litre (M1); C1.
9	Multiplied by 9	$3^2 = 9$ (C2).
10	Shown	$d = 5t^2$ (M1); $t^2 = 16$ (C1).